

Table 2
Concrete mixes (by volume)

Concrete Strength	Cement (part)	Water (part more than)	Sand (parts)	Coarse Aggregate
2,200 psi (15 MPa)	1	4.4 imp. gal. (20 l) per 88 lb. (40 kg) bag of cement	2	4 parts up to 2 in. (50 mm) in size
	1	4.4 imp. gal. (20 l) per 88 lb. (40 kg) bag of cement	-	6 parts pit run gravel
3,000 psi (20 MPa)	1	4.0 imp. gal. (18 l) per 88 lb. (40 kg) bag of cement	1 3/4	3 parts up to 1 1/2 in. (40 mm) in size
	1	4.0 imp. gal. (18 l) per 88 lb. (40 kg) bag of cement	-	4 3/4 parts pit run gravel

Notes to Table 2

1. For higher strength concretes, use commercial suppliers to ensure strength and air entrainment requirements are met.

Table 3
Minimum depths of foundations

Type of Soil	Foundations Containing Heated Basement or Crawl Space		Foundations Containing No Heated Space	
	Good Soil Drainage to at Least the DEPTH of Frost Penetration	Poor Soil Drainage	Good Soil Drainage to at Least the DEPTH of Frost Penetration	Poor Soil Drainage
Clay or soils not clearly defined	4 ft. (1.2 m)	4 ft. (1.2 m)	4 ft. (1.2 m) but not less than the depth of frost penetration	4 ft. (1.2 m) but not less than the depth of frost penetration
Silt	No limit	No limit	Below the depth of frost penetration	Below the depth of frost penetration
Coarse grained soils	No limit	No limit	No limit	Below the depth of frost penetration
Rock	No limit	No limit	No limit	No limit

Table 4
Minimum footing sizes
(Length of supported joists 16 ft. [4.9 m] or less)
(Design floor load 50 lb./sq. ft. [2.4 kN/m²] maximum)

No. of Floors Supported	Minimum Widths of Strip Footings, in. (mm)		Minimum Area of Column Footings ¹ sq. ft. (m ²)
	Supporting Exterior Walls	Supporting Interior Walls	
1	10 (250) ²	8 (200) ³	4.3 (0.4)
2	14 (350) ²	14 (350) ³	8 (0.75)
3	18 (450) ²	20 (500) ³	11 (1.0)

Notes to Table 4

1. Sizes are based on columns spaced 9 ft. 10 in. (3 m) (on center). For other column spacings, footing area must be adjusted in proportion to the distance between columns.

2. For each storey of masonry veneer over wood-frame construction, footing widths must be increased by 1 1/2 in. (65 mm) for each storey of masonry construction other than foundation walls; the footing width must be increased by

5 1/8 in. (130 mm)

3. For each storey of masonry supported by the footing, the footing width must be increased by 4 in. (100 mm)

Table 5
Minimum thickness of foundation walls

Type of Foundation Wall	Minimum Wall Thickness, in. (mm)	Maximum Height of Exterior Finish Grade Above Basement Floor or Inside Grade, ft.-in. (m)	
		Foundation Wall Laterally Unsupported at the Top ¹ to 4	Foundation Wall Laterally Supported at the Top ¹ to 4
Solid concrete, 2,200 psi (15 MPa) minimum strength	6 (150)	2-7 (0.80)	4-11 (1.50)
	8 (200)	3-11 (1.20)	7-0 (2.15)
	10 (250)	4-7 (1.40)	7-6 (2.30)
	12 (300)	4-11 (1.50)	7-6 (2.30)
Solid concrete, 2,900 psi (20 MPa) minimum strength	6 (150)	2-7 (0.80)	5-10 (1.80)
	8 (200)	3-11 (1.20)	7-6 (2.30)
	10 (250)	4-7 (1.40)	7-6 (2.30)
	12 (300)	4-11 (1.50)	7-6 (2.30)
Unit masonry	5 1/2 (140)	1-11 (0.60)	2-7 (0.80)
	9 7/8 (240)	3-11 (1.20)	5-10 (1.80)
	11 7/8 (290)	4-7 (1.40)	7-2 (2.00)

Notes to Table 5

1. Foundation walls are considered laterally supported at the top if the floor joists are embedded in the top of the foundation walls, or if the floor system is anchored to the top of the foundation walls with anchor bolts, in which case the joists may run either parallel or perpendicular to the foundation wall.

2. When a foundation wall contains an opening of more than 3 ft. 11 in. (1.2 m) in length or openings in more than 25 per cent of its length, the portion of the wall beneath such openings is considered laterally unsupported unless the wall around the opening is reinforced to withstand the joint pressure.

3. When the length of solid wall between windows is less than the average length of the windows, the combined length of such windows is considered a single opening.

4. When foundation walls support solid masonry walls, the foundation wall is considered laterally supported by the first floor.

Table 6
Mortar mix proportions (by volume)

Permissible Use of Mortar	Portland Cement	Masonry Cement (Type H)	Lime	Aggregate
All locations ¹	1/2 to 1	1	1/4 to 1/2	
All locations ¹ , except foundation walls and piers	1	1	1/2 to 1 1/4	Not less than 2 1/4 and not more than 3 times the sum of the volumes of the cement and lime
All locations, except loadbearing walls of hollow units	1	1	1 1/4 to 2 1/2	
All non-loadbearing partitions and all loadbearing walls of solid units except foundation walls	1	1	2 1/4 to 4	

Notes to Table 6

1. Must not be used for sand-lime brick or concrete brick.

Table 7
Dimension lumber - grades and uses

Sizes, in. (mm)	Grades	Common Grade Mix ¹	Principal Uses	Grade Category
2 to 4 in. (38 to 89 mm) thick 2 to 4 in. (38 to 89 mm) wide	Select structural No. 1 and No. 2	No. 2 and better (No. 2 & Btr.)	Most common; used in most construction. Shows high strength, stiffness and good appearance. Preferred for trusses, rafters and roof joists.	Structural light framing
No. 3 ²	—	—	Used in construction where high strength and appearance are not important, such as studs in non-loadbearing walls.	
Construction Standard ³	Standard and better (Std. & Btr.)	Standard	Most common; used in general framing work. Has less strength than No. 2 and better structural light framing, but is stronger and allows longer spans than No. 3.	Light framing
Utility ²	—	—	Used most economically where high strength is not important, such as studs and plates in partition walls, blocking and bracing.	
Economy ²	—	—	Used in temporary or low-cost construction where strength and appearance are not important.	

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Table 7 (continued)
Dimension lumber - grades and uses

Sizes, in. (mm)	Grades	Common Grade Mix ¹	Principal Uses	Grade Category
2 to 4 in. (38 to 89 mm) thick 5 in. (114 mm) and wider	Select structural No. 1 and No. 2	No. 2 & Btr.	Most common; used in most construction where high strength and stiffness are desired, such as floor joists, roof joists and rafters.	Structural joists and planks
No. 3 ²	—	—	Used in general construction where strength is not important.	
Economy ²	—	—	Used in temporary or low-cost construction where strength and appearance are not important.	
2 to 4 in. (38 to 89 mm) thick 2 in. (38 mm) and wider	Stud ²	—	Most common; special purpose grade intended for all stud uses, including bearing walls.	Stud
Economy stud ²	—	—	Used in temporary or low-cost construction where strength and appearance are not important.	

Notes to Table 7

1. For studs in grade, sorting at the mill, the higher grades are combined and sold as a grade mix. Pieces of lumber in the grade mix are still individually grade stamped.

2. Except for the utility and economy grades, all grades are stress graded, which means specified strengths have been assigned and span tables calculated.

3. Construction Standard, Stud and No. 3 Grades are typically used in design that are not composed of 3 or more assembly parallel members spaced on 24 in. (600 mm) centres or less, so arranged or connected to mutually support loading.

Table 8 (continued)
Facsimiles of lumber grade marks approved for use in Canada

* Approved to stamp machine-stress rated (MSR) lumber

Facsimile or Grade Mark

Association or organization



10
 CONST S-P-F
 S-GRN

Northwest Territories Forest Industries
 Association
 P.O. Box 220
 Fort Smith, N.W.T. X0E 0P0
 Tel: (867) 872-2155

O.L.M.A.® O1-1
 CONST. S-DRY
 SPRUCE • PINE • FIR

*Ontario Lumber Manufacturers'
 Association
 45 Queen Street West, Suite 210
 Toronto, Ontario M5H 2M5
 Tel: (416) 367-9717
 Website: www.olma.ca

NLGA RULE
 No 1
 S-DRY
 S-P-F

*Pacific Lumber Inspection Bureau
 P.B. Box 19118
 Fourth Avenue Postal Outlet
 Vancouver, British Columbia V6K 4R8
 Tel: (604) 732-1782
 Website: www.plib.org

SP-F
 1
 000 S-DRY

*Québec Forest Industry Council
 Conseil de l'industrie forestière du Québec
 1175, avenue Lavergne, bureau 200
 Saint-Foy, Québec G1V 4P1
 Tel: (418) 657-7916
 Website: www.qfic.qc.ca

Table 9
Commercial species of lumber

Commercial Species Group Designation	Grade Stamp Identification	Species in Combination	Wood Characteristics
Spruce - Pine - Fir	S - P - F	Spruce (all species except coast sitka spruce), lodgepole pine, jack pine, alpine fir, balsam fir	Woods of similar characteristics. They work easily, take paint easily and hold nails well. Generally white to pale yellow in colour.
Douglas Fir - Larch	D Fir - L	Douglas fir, western larch	High degree of hardness and good resistance to decay. Good nail holding, gluing and painting qualities. Colour ranges from reddish-brown to yellowish white.
Hem - Fir	Hem - Fir	Pacific coast hemlock, amabilis fir	They work easily, take paint well and hold nails well. Good gluing characteristics. Colour range pale yellow-brown to white.
Northern Species	North	Western red cedar	Wood with exceptional resistance to decay. Moderate in strength. High in appearance qualities. It works easily and takes fine finishes. Colour varies from reddish-brown heart wood to light sapwood.
	North	Red pine, ponderosa pine	Fairly strong and easy to work. woods that take a good finish and hold nails and screws well. Moderately durable; they season with little checking or cupping. Sapwood is a pale yellow colour; heartwood pale brown to reddish tinge.
		Western white pine, eastern white pine	Softest of the Canadian pines, they work and finish exceptionally well. Not as strong as most pines but do not tend to split or splinter. Good nail holding properties. Low shrinkage, better than all other Canadian species except the cedars. Take stains, paints and varnishes well. Colour of sapwood almost white; heartwood creamy white to light straw brown.
		Trembling aspen, large-leaved aspen, balsam poplar	Light woods of moderate strength, they work easily, finish well and hold nails well. Generally light in colour, varying from almost white to greyish-white.

Table 10
Sizes for dimension lumber and boards

Nominal Size, in.	Actual Size, in.		Metric Equivalent, mm		Metric Nomenclature, mm
	Dry	Green	Dry	Green	
Dimension Lumber	2 x 2	1 1/2 x 1 1/2	1 9/16 x 1 9/16	38 x 38	38 x 38
	3	2 1/2	2 9/16	64	64
	4	3 1/2	3 9/16	89	89
	6	5 1/2	5 9/16	143	140
	8	7 1/4	7 1/2	184	184
Boards	10	9 1/4	9 1/2	235	241
	12	11 1/4	11 1/2	286	286
	3 x 3, etc.	2 1/2 x 2 1/2	2 9/16 x 2 9/16	64 x 64	64 x 64
	4 x 4, etc.	3 1/2 x 3 1/2	3 9/16 x 3 9/16	89 x 89	89 x 89
				90 x 90	89 x 89
	1 x 2	3/4 x 1 1/2	1 3/16 x 1 9/16	19 x 38	19 x 38
	3	1 1/2	1 3/16	64	64
	4	2 1/2	2 9/16	89	89
	5	3 1/2	3 9/16	114	114
	6	4 1/2	4 9/16	140	140
	8	5 1/2	5 9/16	184	184
	10	7 1/4	7 1/2	235	241
	12	9 1/4	9 1/2	286	286
	1 1/2 x 2, etc.	1 x 1 1/2	1 1/2 x 1 9/16	25 x 38	25 x 38
	1 1/2 x 2, etc.	1 1/4 x 1 1/2	1 9/16 x 1 9/16	32 x 38	32 x 38

Table 11
Maximum spans for built-up floor beams supporting not more than one floor^{1,2}

Commercial Designation	Grade	Supported Length, ft. ^{3,4}	Maximum Span, ft.-in. (m) ^{3,4}									
			Size of Built-up Beam, in. (mm)									
			2 x 8 (38 x 184)		2 x 10 (38 x 235)		2 x 12 (38 x 286)		2 x 12 (38 x 286)		2 x 12 (38 x 286)	
D.Fir Larch	No. 1 and No. 2	(m)	3-ply	4-ply	5-ply	3-ply	4-ply	5-ply	3-ply	4-ply	5-ply	5-ply
			8	9-8	11-2	12-6	11-10	13-8	15-3	13-8	15-10	17-8
Hem-Fir	No. 1 and No. 2	2.4	2.97	3.42	3.82	3.63	4.19	4.88	4.21	4.86	5.43	6.10
		3.0	8-8	10-0	11-2	10-7	12-2	13-8	12-3	14-2	15-10	17-8
		3.6	2.65	3.06	3.42	3.24	3.75	4.19	3.76	4.35	4.86	5.43
		4.2	7-11	9-1	10-2	9-8	11-2	12-5	11-2	12-11	14-5	16-1
		4.8	2.42	2.80	3.13	2.96	3.42	3.82	3.44	3.97	4.44	4.91
		5.4	7-4	8-5	9-5	8-11	10-4	11-6	10-4	11-11	12-4	13-8
		6.0	2.24	2.59	2.89	2.74	3.17	3.54	3.18	3.67	4.11	4.58
		6.6	6-10	7-11	8-10	7-4	8-4	9-8	10-9	9-8	11-2	12-6
		7.2	1.88	2.10	2.42	2.27	2.56	2.96	2.56	2.96	3.44	3.91
		7.8	6-5	7-5	8-4	7-10	8-1	9-1	10-2	9-2	10-7	11-9
		8.4	1.98	2.28	2.55	2.42	2.79	3.12	2.81	3.24	3.62	4.00
		9.0	6-1	7-1	7-11	7-5	8-7	9-8	8-8	10-4	11-2	12-6
		9.6	1.88	2.17	2.42	2.29	2.65	2.96	2.66	3.07	3.44	3.81
		10.2	10-1	11-7	12-6	12-5	14-4	15-11	14-4	16-07	18-7	21-0
		10.8	3.11	3.53	3.82	3.80	4.39	4.88	4.41	5.10	5.70	6.27
S.P.F.	No. 1 and No. 2	2.4	9-1	10-5	11-7	11-1	12-9	14-4	12-10	14-10	16-7	19-0
		3.0	2.78	3.21	3.55	3.40	3.93	4.39	3.95	4.56	5.10	5.67
		3.6	8-3	9-7	10-8	10-1	11-8	13-1	11-9	13-7	15-2	17-5
		4.2	2.54	2.93	3.28	3.11	3.59	4.01	3.60	4.16	4.65	5.14
		4.8	7-8	8-10	9-11	9-4	10-10	12-1	10-10	12-6	14-0	16-3
		5.4	2.35	2.72	3.04	2.88	3.32	3.71	3.34	3.85	4.31	4.78
		6.0	7-2	8-3	9-3	8-9	10-1	11-4	10-2	11-9	13-1	15-4
		6.6	2.20	2.54	2.84	2.68	3.11	3.47	3.12	3.60	4.03	4.46
		7.2	6-9	7-10	8-9	8-3	9-6	10-8	9-7	11-1	12-4	14-7
		7.8	2.07	2.39	2.68	2.54	2.93	3.27	2.94	3.40	3.80	4.23
		8.4	6-5	7-5	8-3	7-10	8-0	9-1	10-1	11-4	12-7	15-0
		9.0	1.97	2.27	2.54	2.41	2.78	3.11	2.79	3.22	3.60	3.97
		9.6	10-0	11-0	11-11	12-10	14-1	15-2	14-11	17-2	19-3	21-6
		10.2	3.07	3.38	3.64	3.92	4.32	4.65	4.57	5.25	5.99	6.72
		10.8	9-4	10-3	11-0	11-6	13-1	14-1	13-4	15-4	17-2	19-5
		3.0	2.85	3.14	3.38	3.52	4.01	4.37	4.09	4.72	5.25	5.78
		3.6	8-7	9-8	10-5	10-6	12-1	13-3	12-2	14-0	15-8	17-6
		4.2	2.63	2.95	3.18	3.22	3.71	4.06	3.73	4.31	4.82	5.35
		4.8	7-11	9-2	9-10	9-8	11-2	12-6	11-3	13-0	14-6	16-3
		5.4	2.44	2.80	3.02	2.98	3.44	3.84	3.46	3.99	4.46	4.93
		6.0	7-5	8-7	9-5	9-1	10-6	11-8	10-6	12-2	13-7	15-0
		6.6	2.28	2.63	2.89	2.79	3.22	3.60	3.23	3.73	4.17	4.60
		7.2	7-0	8-1	9-0	8-7	9-10	11-0	9-11	11-5	12-10	14-3
		7.8	2.15	2.48	2.77	2.63	3.03	3.39	3.05	3.52	3.93	4.36
		8.4	6-8	7-8	8-7	8-1	9-4	10-6	9-5	10-10	12-2	14-5
		9.0	2.04	2.35	2.63	2.49	2.88	3.22	2.89	3.34	3.73	4.16
		9.6	10-0	11-0	11-11	12-10	14-1	15-2	14-11	17-2	19-3	21-6
		10.2	3.07	3.38	3.64	3.92	4.32	4.65	4.57	5.25	5.99	6.72
		10.8	9-4	10-3	11-0	11-6	13-1	14-1	13-4	15-4	17-2	19-5

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Table 11 (continued)

Maximum spans for built-up floorbeams supporting not more than one floor^{1,2}

		Maximum Span, ft.-in. (m) ^{3,4}									
		Size of Built-up Beam, in. (mm)									
Commercial Designation	Grade	Supported Length, ft. (m) ^{5,6}	2 x 8 (38 x 184)		2 x 10 (38 x 235)		2 x 12 (38 x 286)		3-ply	4-ply	5-ply
			3-ply	4-ply	3-ply	4-ply	3-ply	4-ply			
Northern Species	No. 1	8	8-5	9-9	10-9	10-3	11-11	13-3	11-11	13-9	15-5
	No. 2	2.4	2-9	2-9	3-29	3-16	3-65	4-08	3-67	4-24	4-74
		10	7-6	8-8	9-9	9-2	10-8	11-11	10-8	12-4	13-9
		12	2-1	2-67	2-99	2-83	3-27	3-65	3-28	3-79	4-24
		14	2-11	2-44	2-73	2-58	2-98	3-33	3-00	3-46	3-87
		16	6-4	7-4	8-3	7-9	8-0	10-1	9-0	10-5	11-8
		18	1-95	2-26	2-52	2-39	2-76	3-09	2-77	3-20	3-58
		20	5-11	6-10	7-8	7-3	8-5	9-5	8-5	9-9	10-11
		22	1-83	2-11	2-36	2-24	2-58	2-89	2-59	3-00	3-35
		24	5-7	6-6	7-3	6-10	7-11	8-0	7-2	8-3	9-3
Hem-Fir	No. 1	8	1-72	1-99	2-23	2-11	2-43	2-72	2-45	2-83	3-16
	No. 2	10	5-4	6-2	6-10	6-6	7-6	8-5	7-7	8-9	9-9
		12	1-64	1-89	2-11	2-00	2-31	2-58	2-32	2-68	3-00
		14	1-64	1-89	2-11	2-00	2-31	2-58	2-32	2-68	3-00

Notes to Table 11

- Spans apply only where the floors serve residential areas.
- When the floors have a concrete topping of not more than 2 in. (51 mm), the spans must be multiplied by 0.8.
- Spans are clear spans between supports. For total span, add two bearing lengths.
- 3-ply beams with supported lengths greater than 13 ft. 8 in. (4.2 m) require 4 1/2 in. (114 mm) of bearing. All other beams require 3 in. (76 mm) bearing.
- Supported length means half the sum of the joint spans on both sides of the beam.
- Straight interpolation may be used for other supported lengths.

Table 12
Maximum spans for built-up floor beams supporting not more than two floors^{1,2}

		Maximum Span, ft.-in. (m) ^{3,4}									
		Size of Built-up Beam, in. (mm)									
Commercial Designation	Grade	Supported Length, ft. (m) ^{5,6}	2 x 8 (38 x 184)		2 x 10 (38 x 235)		2 x 12 (38 x 286)		3-ply	4-ply	5-ply
			3-ply	4-ply	3-ply	4-ply	3-ply	4-ply			
D-Fir and Larch	No. 1	8	7-3	8-4	9-4	8-10	10-2	11-5	10-3	11-10	13-3
	No. 2	2.4	2-22	2-56	2-87	2-72	3-14	3-51	3-15	3-64	4-07
		10	6-6	7-6	8-4	7-11	9-2	10-2	9-2	10-7	11-10
		12	3-0	3-9	4-9	3-6	4-3	5-3	4-3	5-3	6-3
		14	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		16	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		18	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		20	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		22	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		24	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
Hem-Fir	No. 1	8	7-7	8-9	9-9	8-10	10-8	12-0	10-9	12-5	13-11
	No. 2	2.4	2-33	2-69	3-01	2-85	3-29	3-68	3-10	3-82	4-27
		10	6-9	7-10	8-9	8-3	9-7	10-8	9-7	11-1	12-5
		12	3-0	3-9	4-9	3-6	4-3	5-3	4-3	5-3	6-3
		14	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		16	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		18	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		20	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		22	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		24	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
S-P-F	No. 1	8	7-10	8-1	9-11	8-10	10-11	12-5	11-2	13-10	14-5
	No. 2	2.4	2-41	2-79	3-03	2-85	3-41	3-81	3-42	3-95	4-42
		10	7-0	8-1	9-1	8-7	9-11	11-1	10-0	11-6	12-10
		12	3-0	3-9	4-9	3-6	4-3	5-3	4-3	5-3	6-3
		14	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		16	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		18	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		20	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		22	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11
		24	1-8	1-11	1-11	1-11	1-11	1-11	1-11	1-11	1-11

Continued on p. 368

Table 12 (continued)
Maximum spans for built-up floor beams supporting not more than two floors^{1,2}

Commercial Designation		Maximum Span, ft.-in. (m) ^{3,4}											
		Size of Built-up Beams, in. (mm)						Supported Length, ft. (m) ^{5,6}					
		2 x 8 (38 x 184)		2 x 10 (38 x 235)		2 x 12 (38 x 286)		3-ply		4-ply		5-ply	
Northern Species	No. 1 and No. 2	8	6-4	7-3	8-2	7-8	8-11	9-11	8-11	10-4	11-6	11-6	11-6
	2,4	10	5-8	6-6	7-3	6-11	7-11	8-11	8-0	9-3	10-4	10-4	10-4
	3,6	12	5-2	5-11	6-8	6-3	7-3	8-1	7-4	8-5	9-5	9-5	9-5
	4,8	14	4-9	5-6	6-2	5-10	6-9	7-6	6-9	7-10	8-9	8-9	8-9
	6,0	16	4-5	5-2	5-9	5-5	6-3	7-0	6-4	7-4	8-2	8-2	8-2
	8,0	18	4-2	4-10	5-5	5-2	5-11	6-8	6-0	6-11	7-8	7-8	7-8
Southern Species	2,4	10	5-8	6-6	7-3	6-11	7-11	8-11	8-0	9-3	10-4	10-4	10-4
	3,6	12	5-2	5-11	6-8	6-3	7-3	8-1	7-4	8-5	9-5	9-5	9-5
	4,8	14	4-9	5-6	6-2	5-10	6-9	7-6	6-9	7-10	8-9	8-9	8-9
	6,0	16	4-5	5-2	5-9	5-5	6-3	7-0	6-4	7-4	8-2	8-2	8-2
	8,0	18	4-2	4-10	5-5	5-2	5-11	6-8	6-0	6-11	7-8	7-8	7-8
	10,0	20	4-0	4-7	5-2	4-10	5-8	6-3	5-8	6-6	7-4	7-4	7-4

Notes to Table 12:

- Spans apply only where the floors serve residential areas.
- When the floor has a concrete topping of not more than 2 in. (51 mm), the spans must be multiplied by 0.8.
- Spans are clear spans between supports. For total spans, add two bearing lengths.
- 3-ply beams with supported lengths greater than 13 ft. 8 in. (4.2 m) require a 1/2 in. (12.7 mm) bearing.
- All other beams require a 3/4 in. (19 mm) bearing.
- Supported length means half the sum of the joist spans on both sides of the beam.
- Strategic interpretation may be used for other supported lengths.

Table 13
Maximum spans for built-up floor beams supporting not more than three floors^{1,2}

Commercial Designation		Maximum Span, ft.-in. (m) ^{3,4}											
		Size of Built-up Beams, in. (mm)						Supported Length, ft. (m) ^{5,6}					
		2 x 8 (38 x 184)		2 x 10 (38 x 235)		2 x 12 (38 x 286)		3-ply		4-ply		5-ply	
D.Fir and No. 2	8	6-0	6-11	7-9	7-4	8-6	8-7	9-10	11-0	11-0	11-0	11-0	11-0
	2,4	10	5-5	6-3	6-11	6-7	7-7	8-6	7-8	8-10	9-10	9-10	9-10
	3,6	12	4-11	5-8	6-4	6-0	6-11	7-9	7-0	8-1	8-0	8-0	8-0
	4,8	14	4-7	5-3	5-11	5-7	6-6	7-2	6-6	7-6	8-4	8-4	8-4
	6,0	16	4-3	4-11	5-6	5-3	6-0	6-9	6-1	7-0	7-10	7-10	7-10
	8,0	18	4-0	4-8	5-2	4-11	5-8	6-4	5-8	6-7	7-4	7-4	7-4
Hem-Fir	2,4	10	5-8	6-6	7-4	8-2	7-9	8-11	10-0	10-4	10-4	10-4	10-4
	3,6	12	5-2	5-11	6-8	6-3	7-3	8-2	7-1	8-5	9-5	9-5	9-5
	4,8	14	4-8	5-6	6-2	5-7	6-3	7-4	6-4	7-10	8-9	8-9	8-9
	6,0	16	4-2	5-2	5-9	5-1	6-3	7-1	5-3	7-1	8-2	8-2	8-2
	8,0	18	3-10	4-9	5-5	4-8	5-8	6-8	5-4	6-5	7-8	7-8	7-8
	10,0	20	3-7	4-5	5-2	4-4	5-3	6-3	5-0	6-0	7-1	7-1	7-1
S.P.F.	8	6-7	7-7	8-5	8-0	9-3	10-4	9-3	10-9	12-0	12-0	12-0	12-0
	2,4	10	5-10	6-9	7-7	7-2	8-3	9-3	8-4	9-7	10-9	10-9	10-9
	3,6	12	5-4	6-2	6-11	6-6	7-7	8-5	7-7	8-9	9-9	9-9	9-9
	4,8	14	4-11	5-9	6-5	6-0	7-0	7-10	6-10	8-1	9-1	9-1	9-1
	6,0	16	4-5	5-4	6-0	5-5	6-4	7-4	6-2	7-7	8-6	8-6	8-6
	8,0	18	4-2	5-0	5-8	5-0	6-2	7-1	5-9	7-0	8-0	8-0	8-0

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Table 13 (continued)
Maximum spans for built-up floor beams supporting not more than three floors^{1,2}

		Maximum Span, ft.-in. (m) ^{3,4}												
		Size of Built-up Beam, in. (mm)												
		2 x 8 (38 x 184)			2 x 10 (38 x 223)			2 x 12 (38 x 286)						
Commercial Designation	Grade	Supported Length, ft. (m) ^{3,4}	3-ply	4-ply	5-ply	3-ply	4-ply	5-ply	3-ply	4-ply	5-ply	3-ply	4-ply	5-ply
Northern Species	No. 1	8	5-3	6-1	6-9	6-5	7-5	8-3	7-5	8-7	9-7			
		2.4	1.61	1.86	2.08	1.97	2.28	2.55	2.29	2.64	2.96			
	No. 2	10	4-8	5-5	6-1	5-9	6-8	7-5	6-8	7-8	8-7			
		3.0	1.44	1.67	1.86	1.76	2.04	2.28	2.05	2.36	2.64			
		12	4-3	4-11	5-6	5-3	6-1	6-9	6-1	7-0	7-10			
		3.6	1.32	1.52	1.70	1.61	1.86	2.08	1.87	2.16	2.41			
		14	4-0	4-7	5-1	4-10	5-7	6-3	5-8	6-6	7-3			
		4.2	1.22	1.41	1.57	1.49	1.72	1.93	1.73	2.00	2.23			
		16	3-9	4-3	4-10	4-6	5-3	5-10	5-3	6-1	6-10			
		4.8	1.14	1.32	1.47	1.40	1.61	1.80	1.62	1.87	2.09			
Southern Species		18	3-6	4-1	4-6	4-3	4-11	5-6	5-0	5-9	6-5			
		5.4	1.08	1.24	1.39	1.32	1.52	1.70	1.53	1.76	1.97			
		20	3-4	3-10	4-3	4-1	4-8	5-3	4-9	5-5	6-1			
		6.0	1.02	1.18	1.32	1.25	1.44	1.61	1.45	1.67	1.87			

Notes to Table 13

- Spans apply only where the floors serve residential areas.
- When the floors have a concrete topping of not more than 2 in. (51 mm), the spans must be multiplied by 0.8.
- Spans are clear spans between supports. For total span, add two bearing lengths.
- 3-ply beams with supported lengths greater than 13 ft. 8 in. (4.2 m) require 4 (1/2 in. (12 mm)) of bearing.
- All other beams require 3 in. (76 mm) bearing.
- Supported length means half the sum of the joist spans on both sides of the beam.
- Straight interpolation may be used for other supported lengths.

Table 14
Spans for steel floor beams

Section	Supported Joist Length, ft. (m), (half the sum of joist spans for both sides of the beam)														
	7 ft. 10 in.	24 in.	9 ft. 9 in.	3 m	11 ft. 9 in.	3.6 m	13 ft. 9 in.	4.2 m	15 ft. 8 in.	4.8 m	17 ft. 8 in.	5.4 m	19 ft. 11 in.	6.0 m	
One story supported	W150x22	18-0	5-5	17-1	5-2	16-1	4-9	15-8	4-8	15-1	4-6	14-9	4-5	14-1	4-3
	W200x21	21-3	6-5	20-3	6-2	19-5	5-9	18-8	5-7	17-8	5-4	16-8	5-1	16-1	4-9
	W200x27	23-10	7-3	22-7	6-9	21-7	6-6	20-8	6-3	20-0	6-1	19-4	5-9	19-0	5-8
	W200x31	25-7	7-8	24-3	7-4	23-3	7-1	22-3	6-8	21-7	6-6	21-0	6-4	20-3	6-2
	W250x24	28-7	8-1	24-10	7-6	23-10	7-3	22-9	7-0	21-7	6-6	20-3	6-2	19-4	5-9
	W250x33	30-2	9-2	28-6	8-7	27-2	8-3	26-2	8-0	25-3	7-7	24-7	7-5	23-10	7-3
	W250x39	32-9	10-0	30-9	9-4	29-6	9-0	28-2	8-6	27-7	8-4	26-2	8-1	25-10	7-9
	W310x31	34-1	10-4	32-1	9-8	30-9	9-4	29-2	8-9	27-7	8-4	26-2	8-0	24-10	7-6
	W310x39	37-4	11-4	35-1	10-7	32-9	10-0	32-1	9-8	31-2	9-5	30-2	9-2	29-6	9-0
	Two stories supported	W150x22	16-1	4-9	14-3	4-4	13-3	4-1	12-6	3-8	12-6	3-5	11-2	3-4	10-6
W300x21		18-4	5-6	16-8	5-1	15-1	4-6	14-1	4-3	13-4	4-1	12-6	3-8	12-1	3-7
W200x27		21-0	6-4	20-0	6-1	18-4	5-6	17-4	5-3	16-1	4-9	15-4	4-7	14-4	4-4
W200x31		22-7	6-9	21-3	6-5	20-3	6-2	19-0	5-8	17-8	5-4	16-8	5-1	16-1	4-9
W250x24		22-3	6-8	20-0	6-1	18-4	5-6	17-1	5-2	16-1	4-9	15-1	4-6	14-4	4-4
W250x33		26-10	8-2	25-3	7-7	23-0	7-0	21-3	6-5	20-0	6-1	19-0	5-8	18-0	5-5
W250x39		28-10	8-8	27-2	8-3	25-7	7-8	23-7	7-2	22-3	6-8	21-0	6-4	20-0	6-1
W310x31		28-6	8-7	25-7	7-8	23-7	7-2	22-0	6-7	20-3	6-2	19-4	5-9	18-4	5-6
W310x39		32-9	10-0	30-6	9-3	27-10	8-5	25-10	7-9	24-3	7-4	23-0	7-0	22-0	6-7

Notes to Table 14

- The section information provides the beam depth and weight in metric units. For example, a W150 X 22 beam is 6" (150 mm) deep and weighs 14.3 lbs. per foot (22 kg. per meter).

Table 15
Maximum spans for glue-laminated floor beams - 20f-E grade¹

Number of Floors Supported	Beam Width, in. (mm)	Supported Length, ft. (m) ²	Maximum Span, ft.-in. (m) ³ ≤ 5					
			Beam Depth, in. (mm)					
			9	10 1/2	12	13 1/2	15	16 1/2
			(228)	(266)	(304)	(342)	(380)	(418)
1	3 (80)	8	14-1	16-5	18-9	21-1	23-5	25-9
		(2.4)	(4.32)	(5.04)	(5.76)	(6.48)	(7.20)	(7.92)
		10	12-7	14-8	16-9	18-10	21-0	23-1
		(3.0)	(3.87)	(4.51)	(5.15)	(5.80)	(6.44)	(7.09)
		12	11-6	13-5	15-4	17-3	19-2	21-1
		(3.6)	(3.53)	(4.12)	(4.70)	(5.29)	(5.88)	(6.47)
		14	10-8	12-5	14-2	15-11	17-9	19-6
		(4.2)	(3.27)	(3.81)	(4.36)	(4.90)	(5.44)	(5.99)
		16	9-11	11-7	13-3	14-11	16-7	18-3
		(4.8)	(3.06)	(3.57)	(4.07)	(4.58)	(5.09)	(5.60)
1	5 (130)	8	17-11	20-11	23-11	26-11	29-11	32-11
		(5.51)	(6.43)	(7.35)	(8.26)	(9.18)	(10.10)	(11.02)
		10	16-0	18-9	21-5	24-1	26-9	29-5
		(3.0)	(4.93)	(5.75)	(6.57)	(7.39)	(8.21)	(9.03)
		12	14-8	17-1	19-6	22-0	24-5	26-10
		(3.6)	(4.50)	(5.25)	(6.00)	(6.75)	(7.50)	(8.25)
		14	13-7	15-10	18-1	20-4	22-7	24-10
		(4.2)	(4.16)	(4.86)	(5.55)	(6.25)	(6.94)	(7.64)
		16	12-8	14-10	16-11	19-0	21-2	23-3
		(4.8)	(3.90)	(4.54)	(5.19)	(5.84)	(6.49)	(7.14)
2	3 (80)	8	10-8	12-5	14-3	16-0	17-9	19-7
		(2.4)	(3.28)	(3.83)	(4.37)	(4.92)	(5.47)	(6.01)
		10	9-7	11-2	12-9	14-4	15-11	17-6
		(3.0)	(2.93)	(3.42)	(3.91)	(4.40)	(4.89)	(5.38)
		12	8-9	10-2	11-7	13-1	14-6	16-0
		(3.6)	(2.66)	(3.12)	(3.57)	(4.02)	(4.46)	(4.91)
		14	8-1	9-5	10-9	12-1	13-5	14-10
		(4.2)	(2.48)	(2.89)	(3.31)	(3.72)	(4.13)	(4.54)
		16	7-7	8-10	10-1	11-4	12-7	13-10
		(4.8)	(2.32)	(2.71)	(3.09)	(3.48)	(3.86)	(4.25)
2	5 (130)	8	13-11	16-11	19-11	22-11	25-11	28-11
		(5.54)	(6.67)	(7.80)	(8.93)	(10.06)	(11.19)	(12.32)
		10	12-0	14-8	17-6	20-4	23-2	26-0
		(3.0)	(4.93)	(5.75)	(6.57)	(7.39)	(8.21)	(9.03)
		12	10-8	13-5	16-2	18-9	21-6	24-3
		(3.6)	(4.50)	(5.25)	(6.00)	(6.75)	(7.50)	(8.25)
		14	9-7	12-4	15-1	17-8	20-5	23-2
		(4.2)	(4.16)	(4.86)	(5.55)	(6.25)	(6.94)	(7.64)
		16	8-6	11-3	14-0	16-7	19-4	22-1
		(4.8)	(3.90)	(4.54)	(5.19)	(5.84)	(6.49)	(7.14)

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Table 15 (continued)
Maximum spans for glue-laminated floor beams - 20f-E grade¹

Number of Floors Supported	Beam Width, in. (mm)	Supported Length, ft. (m) ²	Maximum Span, ft.-in. (m) ³ ≤ 5					
			Beam Depth, in. (mm)					
			9	10 1/2	12	13 1/2	15	16 1/2
			(228)	(266)	(304)	(342)	(380)	(418)
2	5 (130)	8	13-7	15-10	18-2	20-5	22-8	24-11
		(2.4)	(4.18)	(4.88)	(5.57)	(6.27)	(6.97)	(7.66)
		10	12-2	14-2	16-3	18-3	20-3	22-4
		(3.0)	(3.74)	(4.36)	(4.98)	(5.61)	(6.23)	(6.85)
		12	11-1	13-0	14-10	16-8	18-6	20-4
		(3.6)	(3.41)	(3.98)	(4.55)	(5.12)	(5.69)	(6.26)
		14	10-3	12-0	13-9	15-5	17-2	18-10
		(4.2)	(3.16)	(3.69)	(4.21)	(4.74)	(5.27)	(5.79)
		16	9-7	11-3	12-10	14-5	16-0	17-8
		(4.8)	(2.96)	(3.45)	(3.94)	(4.43)	(4.93)	(5.42)
3	3 (80)	8	8-11	10-5	11-11	13-5	14-11	16-5
		(2.4)	(2.75)	(3.21)	(3.66)	(4.12)	(4.58)	(5.04)
		10	8-0	9-4	10-8	12-0	13-4	14-8
		(3.0)	(2.46)	(2.87)	(3.28)	(3.69)	(4.10)	(4.51)
		12	7-4	8-6	9-9	10-11	12-2	13-5
		(3.6)	(2.24)	(2.62)	(2.99)	(3.37)	(3.74)	(4.11)
		14	6-9	7-11	8-0	10-2	11-3	12-5
		(4.2)	(2.08)	(2.42)	(2.77)	(3.12)	(3.46)	(3.81)
		16	6-4	7-5	8-5	9-6	10-6	11-7
		(4.8)	(1.94)	(2.27)	(2.59)	(2.91)	(3.24)	(3.56)
3	5 (130)	8	11-5	13-4	15-2	17-1	19-0	20-11
		(2.4)	(3.50)	(4.09)	(4.67)	(5.25)	(5.84)	(6.42)
		10	10-2	11-11	13-7	15-4	17-0	18-8
		(3.0)	(3.13)	(3.66)	(4.18)	(4.70)	(5.22)	(5.74)
		12	9-4	10-10	12-5	14-0	15-6	17-1
		(3.6)	(2.86)	(3.34)	(3.81)	(4.29)	(4.77)	(5.24)
		14	8-7	10-1	11-6	13-1	14-4	15-10
		(4.2)	(2.65)	(3.09)	(3.53)	(3.97)	(4.41)	(4.85)
		16	8-1	9-5	10-9	12-1	13-5	14-9
		(4.8)	(2.48)	(2.89)	(3.30)	(3.72)	(4.13)	(4.54)

Notes to Table 15

1. Spans apply only where the floor serves residential areas.
2. Spans are valid for glue-laminated timber conforming to CAN/CSA-O172-M and CAN/CSA-O177-M.
3. Spans are clear spans between supports. For each span, add two bearing lengths.
4. Provide a minimum bearing length of 3 1/2 in. (89 mm).
5. Top edge of beam assumed to be fully laterally supported by joists.
6. Supported length means half the span of the joist spans on both sides of the beam.
7. Straight interpolation may be used for other supported lengths.

Table 16
Maximum spans for floor joists - general cases^{1,2}

Commercial Designation		Maximum Span, ft-in. (m)									
		With Strapping					With Bridging				
Joist Size, in. (mm)		12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	24 (600)
Grade		Joist Spacing, in. (mm)									
		12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	24 (600)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1	10-2 (259)	9-7 (241)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	12-2 (309)	11-7 (291)	11-0 (279)	13-1 (329)	12-4 (309)	11-3 (291)	13-3 (329)	12-10 (309)	11-3 (291)	11-3 (291)
	No. 1 and No. 2	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
	Grading Rules	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
Hem - fir (includes western hemlock and Sitka spruce)	No. 1	10-2 (259)	9-7 (241)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	12-2 (309)	11-7 (291)	11-0 (279)	13-1 (329)	12-4 (309)	11-3 (291)	13-3 (329)	12-10 (309)	11-3 (291)	11-3 (291)
	No. 1 and No. 2	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
	Grading Rules	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
Spruce - pine - fir (includes all species except coast side spruce, jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1	10-2 (259)	9-7 (241)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	12-2 (309)	11-7 (291)	11-0 (279)	13-1 (329)	12-4 (309)	11-3 (291)	13-3 (329)	12-10 (309)	11-3 (291)	11-3 (291)
	No. 1 and No. 2	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
	Grading Rules	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1	10-2 (259)	9-7 (241)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	12-2 (309)	11-7 (291)	11-0 (279)	13-1 (329)	12-4 (309)	11-3 (291)	13-3 (329)	12-10 (309)	11-3 (291)	11-3 (291)
	No. 1 and No. 2	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)
	Grading Rules	13-10 (331)	12-10 (309)	11-10 (287)	14-4 (364)	13-4 (344)	12-4 (309)	15-10 (381)	14-10 (361)	13-10 (331)	13-10 (331)

Notes to Table 16

1. Spans apply only where the floors serve residential areas.
2. Subfloor must comply with minimum requirements from tables 18 and 19.

Table 17
Maximum spans for floor joists - special cases^{1,2}

Commercial Designation		Maximum Span, ft-in. (m)									
		Without Bridging					With Bridging				
Joist Size, in. (mm)		12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	24 (600)
Grade		Joist Spacing, in. (mm)									
		12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	12 (300)	16 (400)	24 (600)	24 (600)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	13-4 (344)	12-7 (312)	11-3 (287)	14-2 (356)	13-1 (329)	11-2 (287)	14-2 (356)	13-1 (329)	11-2 (287)	11-2 (287)
	No. 1 and No. 2	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
	Grading Rules	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
Hem - fir (includes western hemlock and Sitka spruce)	No. 1	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	13-4 (344)	12-7 (312)	11-3 (287)	14-2 (356)	13-1 (329)	11-2 (287)	14-2 (356)	13-1 (329)	11-2 (287)	11-2 (287)
	No. 1 and No. 2	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
	Grading Rules	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
Spruce - pine - fir (includes all species except coast side spruce, jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	13-4 (344)	12-7 (312)	11-3 (287)	14-2 (356)	13-1 (329)	11-2 (287)	14-2 (356)	13-1 (329)	11-2 (287)	11-2 (287)
	No. 1 and No. 2	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
	Grading Rules	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	10-10 (259)	9-10 (229)	8-7 (221)	8-7 (221)
	No. 2	13-4 (344)	12-7 (312)	11-3 (287)	14-2 (356)	13-1 (329)	11-2 (287)	14-2 (356)	13-1 (329)	11-2 (287)	11-2 (287)
	No. 1 and No. 2	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)
	Grading Rules	15-8 (401)	14-9 (381)	13-6 (356)	17-2 (438)	16-4 (413)	14-5 (399)	17-2 (438)	16-4 (413)	14-5 (399)	14-5 (399)

Notes to Table 17

1. Spans apply only where the floors serve residential areas.
2. Subfloor must comply with minimum requirements from tables 18 and 19.
3. No bridging is assumed for spans for floor joists with concrete topping.

Table 18
Minimum thickness of subflooring

	Minimum Subflooring Thickness, in. (mm), for Maximum Joist Spacing as	
	16 (400)	20 (500)
Plywood and OSB, O-2 grade	5/8 (15.5)	5/8 (15.5)
OSB, O-1 grade, and waferboard, R-1 Grade	5/8 (15.5)	5/8 (15.5)
Particleboard	5/8 (15.5)	3/4 (19.0)
Panel mark (performance-rated panels) sub-floor only	1F16	1F20
Panel mark (performance-rated panels) sub-floor and underlay	2F16	2F20
Lumber	1 1/16 (17.0)	3/4 (19.0)

Table 19
Sheathing and subfloor attachment

Element	Minimum Length of Fasteners for Sheathing and Subfloor Attachment, in. (mm)			Minimum No. or Maximum Spacing of Fasteners
	Common or Spiral Nails	Ring Thread Nails or Screws	Roofing Nails	
Plywood, OSB or waferboard up to 3/4 in. (19 mm) thick	2 (51)	1 3/4 (45)	N/A	1 1/2 (38)
Plywood, OSB or waferboard 3/4 in. (19 mm) to 1 1/8 in. (20 mm) thick	2 (51)	1 3/4 (45)	N/A	2 (51)
Plywood, OSB or waferboard over 1 1/8 in. (20 mm) thick	2 1/4 (57)	2 (51)	N/A	N/A
Fibreboard sheathing up to 1/2 in. (13 mm) thick	N/A	N/A	1 3/4 (44)	1 1/8 (28)
Gypsum sheathing up to 1/2 in. (13 mm) thick	N/A	N/A	1 3/4 (44)	N/A
Board lumber 8 in. (184 mm) or less wide	2 (51)	1 3/4 (45)	N/A	2 (51)
Board lumber more than 8 in. (184 mm) wide	2 (51)	1 3/4 (45)	N/A	2 (51)

Table 20
Nailing for framing¹

Construction Detail	Minimum Length of Nails, in. (mm)	Minimum Number or Maximum Spacing of Nails
Floor joist to plate - toe nail	3 1/4 (82)	2
Wood or metal strapping to underside of floor joists	2 1/4 (57)	2
Cross bridging to joists	2 1/4 (57)	2 at each end
Double header or trimmer joists	3 (76)	12 in. (300 mm) (o.c.)
Floor joist to stud (balloon construction)	3 (76)	2
Ledger strip to wood beam	3 1/4 (82)	2 per joist
Joist to joist splices (See Table 29)	3 (76)	2 at each end
Tail joist to adjacent header joist (end nailed) around openings	3 1/4 (82) 4 (101)	5 3
End header joist to adjacent trimmer joist (end nailed) around openings	3 1/4 (82) 4 (101)	5 3
Stud to wall plate (each end) toe nail or end nail	2 1/2 (63) 3 1/4 (82)	4 2
Doubled studs at openings, or studs at walls or wall intersections and corners	3 (76)	30 in. (750 mm) (o.c.)
Doubled top wall plates	3 (76)	24 in. (600 mm) (o.c.)
Bottom wall plate or sole plate to joists or blocking (exterior walls) ¹	3 1/4 (82)	16 in. (400 mm) (o.c.)
Interior walls to framing or subflooring	3 1/4 (82)	24 in. (600 mm) (o.c.)
Horizontal members over openings in non-loadbearing walls - each end	3 1/4 (82)	2
Lintels to studs	3 1/4 (82)	2 at each end
Ceiling joist to plate - toe nail each end	3 1/4 (82)	2
Roof rafter, roof truss or roof joist to plate - toe nail	3 1/4 (82)	3
Rafter plate to each ceiling joist	4 (101)	2
Rafter to joist (with ridge supported)	3 (76)	3
Rafter to joist (with ridge unsupported)	3 (76)	See Table 30
Gusset plate to each rafter at peak	2 1/4 (57)	4

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Table 20 (continued)
Nailing for framing¹

Construction Detail	Minimum Length of Nails, in. (mm)	Minimum Number or Spacing of Nails
Rafter to ridge board - toe nail - end nail	3/4 (82)	3
Collar tie to rafter - each end	3 (76)	3
Collar tie lateral support to each collar tie	2 1/4 (57)	2
Jack rafter to hip or valley rafter	3/4 (82)	2
Roof strut to rafter	3 (76)	3
Roof strut to loadbearing wall - toe nail	3/4 (82)	2
2 in. x 6 in. (38 mm x 140 mm) or less plank decking to support	3/4 (82)	2
Plank decking wider than 2 in. x 6 in. (38 mm x 140 mm) to support	3/4 (82)	3
2 in. (38 mm) edge laid plank decking to support (toe nail)	3 (76)	1
2 in. (38 mm) edge laid plank to each other	3 (76)	18 in. (450 mm) (o.c.)

Note to Table 20

1. Where the bottom wall plate or sole plate of an exterior wall is not nailed to joists or blocking, the exterior wall is permitted to be fastened to the floor framing by plywood, OSB, or sheetrock sheathing that extends down over the floor framing and is fastened to that framing by nails or staples. This wall can also be fastened by tying the wall framing to the floor framing with galvanized straps that are 2 in. (50 mm) wide, 0.016 in. (0.41 mm) in thickness or more, spaced not more than 48 in. (1.2 m) apart and fastened at each end with at least two 2 1/2-in. (63 mm) nails.

Table 21
Size and spacing of studs

Type of Wall	Supported Loads (including dead loads)	Minimum Stud Size in. (mm)	Maximum Stud Spacing in. (mm)	Maximum Unsupported Height ft.-in. (m)
Interior	No load	2 x 2 (38 x 38) 2 x 4 (38 x 89) flat ¹	16 (400) 16 (400)	8-0 (2.4) 11-10 (3.6)
	Attic not accessible by a stairway	2 x 3 (38 x 64) 2 x 4 (38 x 89) 2 x 4 (38 x 89) flat ¹	24 (600) 16 (400) 24 (600)	9-10 (3.0) 8-0 (2.4) 11-10 (3.6)
	Attic accessible by a stairway plus one floor	2 x 4 (38 x 89) flat ¹	16 (400)	8-0 (2.4)
	Roof load plus one floor	2 x 4 (38 x 89)	16 (400)	11-10 (3.6)
	Attic not accessible by a stairway plus two floors	2 x 4 (38 x 89)	16 (400)	11-10 (3.6)
	Roof load	2 x 4 (38 x 89)	16 (400)	11-10 (3.6)
	Attic accessible by a stairway	2 x 3 (38 x 64) 2 x 4 (38 x 89)	16 (400) 24 (600)	8-0 (2.4) 11-10 (3.6)
	Attic not accessible by a stairway plus one floor	2 x 4 (38 x 89)	24 (600)	11-10 (3.6)
	Attic accessible by a stairway plus two floors	2 x 4 (38 x 89) 2 x 6 (38 x 140)	12 (300) 16 (400)	11-10 (3.6) 13-9 (4.3)
	Attic accessible by a stairway plus three floors	2 x 6 (38 x 140)	12 (300)	13-9 (4.3)
Exterior	Roof with or without attic storage	2 x 3 (38 x 64) 2 x 4 (38 x 89)	16 (400) 24 (600)	8-0 (2.4) 9-10 (3.0)
	Roof with or without attic storage plus one floor	2 x 4 (38 x 89) 2 x 6 (38 x 140)	16 (400) 24 (600)	9-10 (3.0) 9-10 (3.0)
	Roof with or without attic storage plus two floors	2 x 4 (38 x 89) 2 x 6 (38 x 140)	12 (300) 16 (400)	9-10 (3.0) 11-10 (3.6)
	Roof with or without attic storage plus three floors	2 x 6 (38 x 140)	12 (300)	6-0 (1.8)
	Roof with or without attic storage plus three floors	2 x 6 (38 x 140)	12 (300)	6-0 (1.8)
	Roof with or without attic storage plus three floors	2 x 6 (38 x 140)	12 (300)	6-0 (1.8)

Notes to Table 21

1. Studs on the flat are permitted to be used in gable ends of roofs that contain only unfinished space or in non-loadbearing interior walls within the limits described in the National Building Code of Canada. Studs supporting only a load from an attic not accessible from a stairway are permitted to be placed on the flat in accordance with this table, if they are clad on not less than one side with plywood, OSB, or sheetrock sheathing fastened to the face of the studs with a structural adhesive, and if the portion of the roof supported by the studs does not exceed 6 ft., 10 in. (2.1 m) in width.

Table 22
Maximum spans for spruce - pine - fir lintels - No. 1 or No. 2 grade - non-structural sheathing⁷

		Maximum Span ft.-in. (m) ^{2,3}					
		Exterior Walls					
Lintel Supporting	Lintel Size, in. (mm) ⁴	Specified Snow Load, psf (kPa) ⁶					Interior Wall
		20.9 1.0	31.3 1.5	41.8 2.0	52.2 2.5	62.7 3.0	
United attic storage and ceiling	2-2 x 4 2-3B x 89 2-2 x 6 2-3B x 140 2-2 x 8 2-3B x 184 2-2 x 10 2-3B x 235 2-2 x 12 2-3B x 286						4-2 1.27 6-4 1.93 7-9 2.35 9-5 2.88 11-0 3.34
				This area intentionally left blank			
United Supporting Roof and ceiling only (tributary width 2 ft. (0.6 m)) ⁶	2-2x4 2-3Bx89 2-2x6 2-3Bx140 2-2x8 2-3Bx184 2-2x10 2-3Bx235 2-2x12 2-3Bx286	8-4 2.55 13-2 4.01 17-4 5.27 20-11 6.37 24-3 7.38	7-4 2.23 11-4 3.50 15-1 4.61 18-11 5.76 21-11 6.67	6-8 2.02 10-5 3.18 13-9 4.18 17-4 5.34 19-3 6.21	6-2 1.88 9-8 2.96 12-9 3.88 16-3 4.96 18-5 5.87	5-10 1.27 9-2 2.78 12-0 3.66 15-4 4.57 18-5 5.61	6-2 1.88 9-8 2.96 12-9 3.88 16-3 4.96 18-5 5.87
United Supporting Roof and ceiling only (tributary width 16 ft. 0 in. (4.9 m)) ¹	2-2x4 2-3Bx89 2-2x6 2-3Bx140 2-2x8 2-3Bx184 2-2x10 2-3Bx235 2-2x12 2-3Bx286	4-2 1.27 6-4 1.93 7-9 2.35 9-5 2.88 11-0 3.34	3-8 1.11 5-5 1.66 6-8 2.02 8-1 2.47 9-5 2.87	3-4 1.01 4-10 1.48 5-11 1.80 7-3 2.20 8-5 2.56	3-1 0.93 4-5 1.35 5-5 1.64 6-7 2.01 7-8 2.33	2-10 0.87 4-1 1.25 5-0 1.52 6-1 1.84 7-8 2.09	3-1 0.93 4-5 1.35 5-5 1.64 6-7 2.01 7-8 2.33
United Supporting Roof ceiling and storey/2.5	2-2x4 2-3Bx89 2-2x6 2-3Bx140 2-2x8 2-3Bx184 2-2x10 2-3Bx235 2-2x12 2-3Bx286	3-5 1.05 4-11 1.49 6-8 1.82 7-3 2.22 8-5 2.58	3-2 0.96 4-6 1.37 5-4 1.67 6-8 2.04 7-3 2.36	2-11 0.89 4-2 1.27 5-1 1.55 6-2 1.89 7-1 2.15	2-9 0.84 3-11 1.19 4-9 1.44 5-8 1.73 6-5 1.96	2-7 0.79 3-8 1.13 4-4 1.33 5-3 1.59 5-11 1.81	2-5 0.74 3-4 1.02 3-11 1.20 4-9 1.45 5-5 1.66

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Table 22 (continued)
Maximum spans for spruce - pine - fir lintels - No. 1 or No. 2 grade -
non-structural sheathing?

Maximum Span, ft-in, (m) ^{2,3}					
Exterior Walls					
Unlabeled Supporting	Unlabeled Size, in. (mm) ⁴	20.9 2-ply	Specified Snow Load, psf (kPa) ⁶		Interior Walls
			31.3 1.5	41.8 2.0	
Unlabeled Supporting Roof ceiling and 2 storeys ^{1,2,5}					
2-2x4	3-1	2-11	2-9	2-7	2-6
2-3x8/9	0.94	0.88	0.83	0.79	0.76
2-2x6	4-3	4-2	3-11	3-8	3-6
2-3x4-10	1.34	1.26	1.19	1.13	1.06
2-2x8	5-4	5-0	4-9	4-4	4-1
2-3x10/14	1.63	1.51	1.44	1.33	1.25
2-2x10	6-6	6-2	5-8	5-3	4-11
2-3x12/15	1.99	1.87	1.72	1.60	1.50
2-2x12	7-7	6-11	6-5	6-0	5-7
2-3x12/16	2.31	2.12	1.96	1.82	1.71
Unlabeled Supporting Roof ceiling and storeys ^{1,2,5}					
2-2x4	2-11	2-9	2-7	2-6	2-5
2-3x8/9	0.88	0.83	0.80	0.77	0.74
2-2x6	4-1	3-11	3-9	3-7	3-4
2-3x4-10	1.25	1.19	1.14	1.08	1.02
2-2x8	5-0	4-9	4-5	4-2	3-11
2-3x10/14	1.52	1.44	1.35	1.27	1.21
2-2x10	6-1	5-8	5-4	5-0	4-9
2-3x12/15	1.86	1.73	1.62	1.53	1.46
2-2x12	6-11	6-5	6-1	5-9	5-5
2-3x12/16	2.11	1.96	1.84	1.74	1.66

Notes to Table 22

1. Load spans are calculated based on a maximum floor joist roof joist or rafter span of 16 ft, 0 in. (4.9 m) and a maximum roof truss span of 24 ft, 0 in. (7.3 m). Load spans may be increased by 25% if rafter and joist spans are no greater than 14 ft, 1 in. (4.3 m), and roof truss spans are no greater than 28 ft, 3 in. (8.6 m). Spans may be increased by 100% if rafter and joist spans are no greater than 12 ft, 2 in. (3.7 m) and roof truss spans are no greater than 24 ft, 3 in. (7.4 m).

2. If floor joists span the full width of the building without support, load spans shall be reduced by 15% for "Roof ceiling and 1 scores", by 70% for "Roof ceiling and 2 trusses", and by 25% for "Roof ceiling and 3 scores". For ends of limits fully supported by walls.

For ends of linings fully supported by walls, provide minimum 1" (25 mm) of base material. For ends of linings not fully supported by walls, provide minimum 1" (25 mm) of base material. For ends of linings fully supported by walls, provide minimum 1" (25 mm) of base material. For ends of linings not fully supported by walls, provide minimum 1" (25 mm) of base material.

A single piece of 3 1/2 in. (89 mm) thick lumber may be used in lieu of 2 pieces of 1 1/2 in. (38 mm) thick lumber.

When untrussed, the roof is supported by 2 ft (0.6 m) wide end walls that support only a 2 ft (0.6 m) width of roof trusses. Support roof joists, roof rafters or roof trusses.

When structural sheathing is used, linal spans may be increased by 15%. Structural sheathing consists of a minimum 3/8 in. (9.5 mm) thick structural panel conforming to CSA O121, CSA O151, CSA O437 or CSA O375 fastened with at least two rows of fasteners to the exterior face of the linal, and a single row to the two other faces.

and empty row to the top plates and studs.

Table 23

Maximum spans for built-up ridge beams and lintels supporting roof and ceiling only, No. 1 or No. 2 grade

Commercial Designation	Lintel Size, in. (mm)	Maximum Span, ft.-in. (m) ^{1, 2, 3}				
		Specified Snow Load, psf (kPa)				
Spruce - pine - fir (includes Spruce (all species except Coast Sitka Spruce), Jack Pine, Lodgepole Pine, Balsam Fir and Alpine Fir)	2 x 8	20.9	31.3	41.8	52.2	62.7
	3 x 8	1.0	1.5	2.0	2.5	3.0
	3-ply	9-6	8-2	7-3	6-7	6-1
	4-ply	2.88	2.48	2.21	2.01	1.86
	5-ply	10-10	9-5	8-4	7-7	7-0
2 x 10 38 x 235	3-ply	3.30	2.86	2.55	2.32	2.14
	4-ply	11-8	10-2	9-3	8-6	7-10
	5-ply	3.55	3.10	2.82	2.59	2.40
	3-ply	11-7	9-11	8-10	8-1	7-5
	4-ply	3.53	3.03	2.70	2.46	2.27
2 x 12 38 x 286	3-ply	13-4	11-6	10-3	9-4	8-7
	4-ply	4.07	3.50	3.12	2.84	2.62
	5-ply	14-11	12-10	11-5	10-3	9-7
	3-ply	4.54	3.91	3.43	3.17	2.93
	4-ply	13-9	11-6	10-3	9-4	8-8
4-ply	5-ply	4.09	3.52	3.13	2.85	2.63
	3-ply	15-6	13-4	11-10	10-10	10-0
	4-ply	4.72	4.06	3.62	3.29	3.04
	5-ply	17-4	14-11	13-3	12-1	11-2
	6-ply	5.28	4.54	4.04	3.68	3.40

Notes to Table 23

1. Beam and lintel spans are calculated based on a maximum supported length of 16 ft., 0 in. (4.9 m). Spans may be increased by 5% for supported lengths not more than 14 ft., 1 in. (4.3 m), by 10% for supported lengths not more than 12 ft., 2 in. (3.7 m) and by 25% for supported lengths not more than 7 ft., 10 in. (2.4 m).

2. For ridge beams, supported length means half the sum of the rafter, joist or truss span on both sides of the beam. For lintels, supported length means half the sum of truss, roof joist or rafter span supported by the lintel plus the length of the overhang beyond the lintel.

3. Provide minimum 3 in. (76 mm) bearing.

Table 24
Minimum thickness of wall sheathing

Type of Sheathing	Minimum Thickness, in. (mm)				Material Standards
	With Supports 16 (400) o.c.	With Supports 20 (500) o.c.	With Supports 24 (600) o.c.	With Supports 24 (600) o.c.	
Structural					
Plyboard (insulating)	3/8 (9.5)	-	-	-	CAN/CSA-A247
Gypsum sheathing	3/8 (9.5)	-	-	-	CAN/CSA-A8227-M
Plywood (exterior type)	1/4 (6.0)	-	-	-	CSA O171-M
					CSA O151-M
					CSA O153-M
OSB, O-1 grade, and waterboard					
R-1 grade	1/4 (6.35)	-	-	-	CSA O437.0
Panel mark (performance-rated panels)	W16	W20	W24	W24	CSA O325.0
Lumber	1 1/16 (17.0)	-	-	-	See Table 7
Mineral fibre, rigid board, type 2	1 (25)	-	-	-	CSA A101-M
OSB, O-2 grade	1/4 (6.0)	-	-	-	CSA O437.0
Phenolic, faced	1 (25)	-	-	-	CAN/CSB-S1.25-M
Non-Structural					
Expanded Polystyrene (Types 1 and 2)	1-1/2 (38)	-	-	-	CAN/CSB-S1.20-M
Expanded Polystyrene (Types 3 and 4)	1 (25)	-	-	-	CAN/CSB-S1.20-M
Urethane and Isocyanurate (Types 1, 2 and 4)	1-1/2 (38)	-	-	-	CGSB 51-GP-21M
Urethane and Isocyanurate (Type 3)	1 (25)	-	-	-	CGSB 51-GP-21M
Urethane and Isocyanurate (Types 1 and 2), faced	1 (25)	-	-	-	CAN/CSB-S1.26-M

Table 25

Maximum spans for roof joists - specified roof snow loads 20.9 to 41.8 psf (1.0 to 2.0 kPa)

Commercial Designation		Maximum Span, ft.-in. (m)									
		Specified Snow Load, psf (kPa) ¹									
		20.9 (1.0)	31.3 (1.5)	41.8 (2.0)							
Grade	Joint Size, in. (mm)	Joint Spacing, in. (mm)					Joint Spacing, in. (mm)				
		12 (305)	16 (406)	24 (609)	30 (762)	36 (914)	12 (305)	16 (406)	24 (609)	30 (762)	36 (914)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1 (38x89) and No. 2 (38x140)	8-6 (219)	7-9 (206)	6-9 (178)	5-11 (140)	5-11 (140)	6-9 (178)	5-11 (140)	5-11 (140)	6-9 (178)	5-4 (133)
13-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)
Hem - fir (includes western hemlock and amabilis fir)	No. 1 (38x89) and No. 2 (38x140)	8-6 (219)	7-9 (206)	6-9 (178)	5-11 (140)	5-11 (140)	6-9 (178)	5-11 (140)	5-11 (140)	6-9 (178)	5-4 (133)
16-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)
Spruce - pine - fir (includes spruce [all except coast sides spruces], jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1 (38x89) and No. 2 (38x140)	8-1 (206)	7-4 (188)	6-5 (165)	5-7 (140)	5-7 (140)	6-5 (165)	5-7 (140)	5-7 (140)	6-5 (165)	5-1 (127)
16-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1 (38x89) and No. 2 (38x140)	7-4 (188)	6-8 (173)	5-10 (127)	5-10 (127)	5-10 (127)	6-5 (165)	5-10 (127)	5-10 (127)	6-5 (165)	4-7 (119)
16-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)

Notes to Table 25

1. To determine the specified snow load in your location, contact your municipal building department.

Table 26

Maximum spans for roof joists - specified roof snow loads 52.2 and 62.7 psf (2.5 and 3.0 kPa)

Commercial Designation		Maximum Span, ft.-in. (m)									
		Specified Snow Load, psf (kPa) ¹									
		52.2 (2.5)	62.7 (3.0)								
Grade	Joint Size, in. (mm)	Joint Spacing, in. (mm)					Joint Spacing, in. (mm)				
		12 (305)	16 (406)	24 (609)	30 (762)	36 (914)	12 (305)	16 (406)	24 (609)	30 (762)	36 (914)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1 (38x89) and No. 2 (38x140)	6-3 (160)	5-8 (146)	5-0 (127)	4-8 (122)	4-8 (122)	6-3 (160)	5-8 (146)	5-0 (127)	4-8 (122)	4-8 (122)
13-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)
Hem - fir (includes western hemlock and amabilis fir)	No. 1 (38x89) and No. 2 (38x140)	6-3 (160)	5-8 (146)	5-0 (127)	4-8 (122)	4-8 (122)	6-3 (160)	5-8 (146)	5-0 (127)	4-8 (122)	4-8 (122)
16-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)
Spruce - pine - fir (includes spruce [all except coast sides spruces], jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1 (38x89) and No. 2 (38x140)	6-0 (152)	5-5 (140)	4-9 (124)	4-6 (117)	4-6 (117)	6-0 (152)	5-5 (140)	4-9 (124)	4-6 (117)	4-6 (117)
16-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1 (38x89) and No. 2 (38x140)	5-5 (140)	4-11 (104)	4-3 (109)	4-0 (102)	4-0 (102)	5-5 (140)	4-11 (104)	4-3 (109)	4-0 (102)	4-0 (102)
16-10	2x4 (38x89) 2x6 (38x140) 2x8 (38x184) 2x10 (38x235) 2x12 (38x286)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	13-5 (343) 12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	12-5 (318) 11-7 (297) 10-8 (274) 9-8 (250)	11-7 (297) 10-8 (274) 9-8 (250)	10-8 (274) 9-8 (250)	8-5 (216) 7-4 (188) 6-5 (165) 5-4 (138)

Notes to Table 26

1. To determine the specified snow load in your location, contact your municipal building department.

Table 27

Maximum spans for roof rafters - specified roof snow loads 20.9 to 41.8 psf (1.0 to 2.0 kPa)

Commercial Designation	Rafter Size, in. (mm)	Maximum Span, ft.-in. (m)				
		Specified Snow Load, psf (kPa) ¹				
		20.9 (1.0)	31.3 (1.5)	41.8 (2.0)	52.2 (2.5)	62.7 (3.0)
Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1 and No. 2	10-9 (277)	9-4 (246)	8-6 (236)	7-5 (206)	6-9 (206)
	2x4 (38x89)	12-1 (327)	10-9 (277)	9-4 (246)	8-6 (236)	7-5 (206)
	2x6 (38x140)	14-9 (355)	12-1 (327)	10-9 (277)	9-4 (246)	8-6 (236)
	2x8 (38x184)	16-10 (407)	14-9 (355)	12-1 (327)	10-9 (277)	9-4 (246)
	2x10 (38x235)	18-10 (459)	16-10 (407)	14-9 (355)	12-1 (327)	10-9 (277)
	2x12 (38x286)	20-11 (511)	18-10 (459)	16-10 (407)	14-9 (355)	12-1 (327)
Hem - fir (includes western hemlock and amabilis fir)	No. 1 and No. 2	10-9 (277)	9-4 (246)	8-6 (236)	7-5 (206)	6-9 (206)
	2x4 (38x89)	12-1 (327)	10-9 (277)	9-4 (246)	8-6 (236)	7-5 (206)
	2x6 (38x140)	14-9 (355)	12-1 (327)	10-9 (277)	9-4 (246)	8-6 (236)
	2x8 (38x184)	16-10 (407)	14-9 (355)	12-1 (327)	10-9 (277)	9-4 (246)
	2x10 (38x235)	18-10 (459)	16-10 (407)	14-9 (355)	12-1 (327)	10-9 (277)
	2x12 (38x286)	20-11 (511)	18-10 (459)	16-10 (407)	14-9 (355)	12-1 (327)
Spruce - pine - fir (includes spruce [all species except coast sierra spruce], jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1 and No. 2	10-3 (263)	9-3 (247)	8-1 (217)	7-1 (197)	6-5 (177)
	2x4 (38x89)	12-1 (327)	10-9 (277)	9-4 (246)	8-6 (236)	7-5 (206)
	2x6 (38x140)	14-9 (355)	12-1 (327)	10-9 (277)	9-4 (246)	8-6 (236)
	2x8 (38x184)	16-10 (407)	14-9 (355)	12-1 (327)	10-9 (277)	9-4 (246)
	2x10 (38x235)	18-10 (459)	16-10 (407)	14-9 (355)	12-1 (327)	10-9 (277)
	2x12 (38x286)	20-11 (511)	18-10 (459)	16-10 (407)	14-9 (355)	12-1 (327)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1 and No. 2	9-3 (247)	8-1 (217)	7-1 (197)	6-5 (177)	5-10 (147)
	2x4 (38x89)	11-3 (287)	9-3 (247)	8-1 (217)	7-1 (197)	6-5 (177)
	2x6 (38x140)	13-3 (327)	11-3 (287)	9-3 (247)	8-1 (217)	7-1 (197)
	2x8 (38x184)	15-3 (367)	13-3 (327)	11-3 (287)	9-3 (247)	8-1 (217)
	2x10 (38x235)	17-3 (407)	15-3 (367)	13-3 (327)	11-3 (287)	9-3 (247)
	2x12 (38x286)	19-3 (447)	17-3 (407)	15-3 (367)	13-3 (327)	9-3 (247)

Note on Table 27

1. To determine the specified snow load in your location, contact your municipal building department.

Table 28

Maximum spans for roof rafters - specified roof snow loads 52.2 and 62.7 psf (2.5 and 3.0 kPa)

Commercial Designation	Rafter Size, in. (mm)	Maximum Span, ft.-in. (m)				
		Specified Snow Load, psf (kPa) ¹				
		52.2 (2.5)	62.7 (3.0)	72.7 (3.3)	82.7 (3.8)	92.7 (4.2)
Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)	Rafter Spacing, in. (mm)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1 and No. 2	7-11 (211)	6-11 (181)	5-11 (151)	4-11 (121)	3-11 (91)
	2x4 (38x89)	8-11 (241)	7-11 (211)	6-11 (181)	5-11 (151)	4-11 (121)
	2x6 (38x140)	9-11 (271)	8-11 (241)	7-11 (211)	6-11 (181)	5-11 (151)
	2x8 (38x184)	10-11 (301)	9-11 (271)	8-11 (241)	7-11 (211)	6-11 (181)
	2x10 (38x235)	11-11 (331)	10-11 (301)	9-11 (271)	8-11 (241)	7-11 (211)
	2x12 (38x286)	12-11 (361)	11-11 (331)	10-11 (301)	9-11 (271)	8-11 (241)
Hem - fir (includes western hemlock and amabilis fir)	No. 1 and No. 2	7-11 (211)	6-11 (181)	5-11 (151)	4-11 (121)	3-11 (91)
	2x4 (38x89)	8-11 (241)	7-11 (211)	6-11 (181)	5-11 (151)	4-11 (121)
	2x6 (38x140)	9-11 (271)	8-11 (241)	7-11 (211)	6-11 (181)	5-11 (151)
	2x8 (38x184)	10-11 (301)	9-11 (271)	8-11 (241)	7-11 (211)	6-11 (181)
	2x10 (38x235)	11-11 (331)	10-11 (301)	9-11 (271)	8-11 (241)	7-11 (211)
	2x12 (38x286)	12-11 (361)	11-11 (331)	10-11 (301)	9-11 (271)	8-11 (241)
Spruce - pine - fir (includes spruce [all species except coast sierra spruce], jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1 and No. 2	7-6 (216)	6-6 (196)	5-6 (176)	4-6 (156)	3-6 (136)
	2x4 (38x89)	8-6 (246)	7-6 (216)	6-6 (196)	5-6 (176)	4-6 (156)
	2x6 (38x140)	9-6 (276)	8-6 (246)	7-6 (216)	6-6 (196)	5-6 (176)
	2x8 (38x184)	10-6 (306)	9-6 (276)	8-6 (246)	7-6 (216)	6-6 (196)
	2x10 (38x235)	11-6 (336)	10-6 (306)	9-6 (276)	8-6 (246)	7-6 (216)
	2x12 (38x286)	12-6 (366)	11-6 (336)	10-6 (306)	9-6 (276)	8-6 (246)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1 and No. 2	6-10 (180)	5-10 (160)	4-10 (140)	3-10 (120)	2-10 (100)
	2x4 (38x89)	7-10 (210)	6-10 (180)	5-10 (160)	4-10 (140)	3-10 (120)
	2x6 (38x140)	8-10 (240)	7-10 (210)	6-10 (180)	5-10 (160)	4-10 (140)
	2x8 (38x184)	9-10 (270)	8-10 (240)	7-10 (210)	6-10 (180)	5-10 (160)
	2x10 (38x235)	10-10 (300)	9-10 (270)	8-10 (240)	7-10 (210)	6-10 (180)
	2x12 (38x286)	11-10 (330)	10-10 (300)	9-10 (270)	8-10 (240)	7-10 (210)

Note on Table 28

1. To determine the specified snow load in your location, contact your municipal building department.

Table 29

Maximum spans for ceiling joists - attic not accessible by a stairway

Commercial Designation	Grade	Joist Size, in. (mm)	Maximum Span, ft.-in. (m)		
			12 (300)	16 (400)	24 (600)
Douglas fir - larch (includes Douglas fir and western larch)	No. 1	2x4 (38x89)	10-9 (3.27)	9-9 (2.97)	8-6 (2.59)
	No. 2	2x6 (38x140)	16-10 (5.14)	15-4 (4.67)	13-5 (4.08)
		2x8 (38x184)	22-2 (6.76)	20-2 (6.14)	17-7 (5.36)
		2x10 (38x235)	28-4 (8.63)	25-9 (7.84)	22-6 (6.85)
		2x12 (38x286)	34-5 (10.50)	31-3 (9.54)	27-4 (8.34)
Hem - fir (includes western hemlock and amabilis fir)	No. 1	2x4 (38x89)	10-9 (3.27)	9-9 (2.97)	8-6 (2.59)
	No. 2	2x6 (38x140)	16-10 (5.14)	15-4 (4.67)	13-5 (4.08)
		2x8 (38x184)	22-2 (6.76)	20-2 (6.14)	17-7 (5.36)
		2x10 (38x235)	28-4 (8.63)	25-9 (7.84)	22-6 (6.85)
		2x12 (38x286)	34-5 (10.50)	31-3 (9.54)	27-4 (8.34)
Spruce - pine - fir (includes spruce, fir, and larch except coast side spruce), jack pine, lodgepole pine, balsam fir and alpine fir)	No. 1	2x4 (38x89)	10-9 (3.27)	9-9 (2.97)	8-6 (2.59)
	No. 2	2x6 (38x140)	16-10 (5.14)	15-4 (4.67)	13-5 (4.08)
		2x8 (38x184)	22-2 (6.76)	20-2 (6.14)	17-7 (5.36)
		2x10 (38x235)	28-4 (8.63)	25-9 (7.84)	22-6 (6.85)
		2x12 (38x286)	34-5 (10.50)	31-3 (9.54)	27-4 (8.34)
Northern species (includes any Canadian species covered by the NLGA Standard Grading Rules)	No. 1	2x4 (38x89)	10-9 (3.27)	9-9 (2.97)	8-6 (2.59)
	No. 2	2x6 (38x140)	16-10 (5.14)	15-4 (4.67)	13-5 (4.08)
		2x8 (38x184)	22-2 (6.76)	20-2 (6.14)	17-7 (5.36)
		2x10 (38x235)	28-4 (8.63)	25-9 (7.84)	22-6 (6.85)
		2x12 (38x286)	34-5 (10.50)	31-3 (9.54)	27-4 (8.34)

Table 30
Minimum rafter-to-joint nailing

Rafter Tied to Every Joint										Rafter Tied to Joint Every 3 ft., 11 in. (1.2 m)															
Building Width up to										Building Width up to															
26 ft., 3 in. (8 m)					32 ft., 2 in. (9.8 m)					26 ft., 3 in. (8 m)					32 ft., 2 in. (9.8 m)										
Roof Slope	Rafter Spacing in. (mm)	20				30				40				20				30				40			
		(1)	(1.5)	or more	less	(1)	(1.5)	or more	less	(1)	(1.5)	or more	less	(1)	(1.5)	or more	less	(1)	(1.5)	or more	less				
1:3	16 (400)	4	5	6	5	7	8	11	-	-	-	-	-	-	-	-	-	-	-	-	-				
	24 (600)	6	8	9	8	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-				
1:2.4	16 (400)	4	4	5	5	6	7	7	10	-	-	-	-	-	-	-	-	-	-	-	-				
	24 (600)	5	7	8	7	9	11	7	10	-	-	-	-	-	-	-	-	-	-	-	-				
1:2	16 (400)	4	4	4	4	4	5	6	8	9	8	-	-	-	-	-	-	-	-	-	-				
	24 (600)	4	5	6	5	7	8	6	8	9	8	-	-	-	-	-	-	-	-	-	-				
1:1.71	16 (400)	4	4	4	4	4	4	4	5	7	8	7	9	11	-	-	-	-	-	-	-				
	24 (600)	4	4	5	5	6	7	5	7	8	7	9	11	-	-	-	-	-	-	-	-				
1:1.33	16 (400)	4	4	4	4	4	4	4	4	5	6	5	6	7	9	11	-	-	-	-	-				
	24 (600)	4	4	4	4	4	4	4	5	6	7	5	7	8	7	9	11	-	-	-	-				
1:1	16 (400)	4	4	4	4	4	4	4	4	4	5	4	5	6	5	6	7	-	-	-	-				
	24 (600)	4	4	4	4	4	4	4	4	4	4	4	5	6	5	6	7	-	-	-	-				
1:0.75	16 (400)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	-	-	-				
	24 (600)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	-	-				

Notes to Table 30

1 Nails not less than 3/8 in. (79 mm).

2 Ceiling joists must be fastened together with at least one more nail per joint space than required for the rafter-to-joint connection.

3 To determine the specified snow load in your location, contact your municipal building department.

Table 31
Minimum thickness of flashing materials

Material	Minimum Thickness, in. (mm)	
	Roof Flashing	Wall Flashing
	Cladding	Above Grade Masonry
	Exposed	Concealed
Aluminum	0.019 (0.48)	0.019 (0.48)
Copper	0.018 (0.46)	0.014 (0.36)
Copper or aluminum laminated to felt or kraft paper	-	-
Galvanized steel	0.013 (0.33)	0.013 (0.33)
Lead sheet	0.068 (1.73)	0.068 (1.73)
Polyethylene	-	-
Roll roofing, types	-	-
Zinc	0.014 (0.35)	0.014 (0.35)
Vinyl	-	-

Table 32
Minimum thickness of roof sheathing for sloping roofs¹

	Sheathing Thickness, in. (mm), for Truss or Rafter Spacing at			
	12 (300)	16 (400)	20 (500)	24 (600)
Plywood and OSB, O-2 grade	Supported ² edges Unsupported edges	5/16 (7.5) 3/8 (9.5)	5/16 (7.5) 3/8 (9.5)	3/8 (9.5) 1/2 (12.7)
OSB, O-1 grade and waferboard	Supported edges Unsupported edges	3/8 (9.5) 3/8 (9.5)	3/8 (9.5) 7/16 (11.1)	7/16 (11.1) 1/2 (12.7)
Panel mark (performance-rated panels)	Supported ² edges	-	1R16	1R24
Panel mark (performance-rated panels)	Unsupported edges	-	2R16	2R24
Lumber ³	-	1 1/16 (17)	1 1/16 (17)	3/4 (19)

Notes for Table 32

1. The thickness of sheathing for flat roofs used as walking decks is the same as for safloors (see Table 1B).
2. Supported edges between panels by means of 14 clips or minimum 2 in.-x-2 in. (38mm-x38 mm) blocking between trusses or rafters.
3. For eastern white pine and red pine, minimum lumber grade is No. 4 common. For all other species, the minimum grades shall be standard or No. 3 common.

Table 33
Roofing types and slope limits for roofs

Type of Roofing	Slope	
	Minimum	Maximum
Built-up roofing		
Asphalt base (graveled)	1 in 50	1 in 4
Asphalt base (without gravel)	1 in 25	1 in 2
Coal-tar base (graveled)	1 in 50	1 in 25
Cold process	1 in 25	1 in 1.33
Asphalt shingles		
Normal Application	1 in 3	No limit
Low slope application	1 in 6	No limit
Roll roofing		
Smooth and mineral surfaced	1 in 4	No limit
19 in. (480 mm) wide selvage asphalt roofing	1 in 6	No limit
Cold application felt	1 in 50	1 in 1.33
Wood shingles	1 in 4	No limit
Handsplit shakes	1 in 3	No limit
Asbestos-cement corrugated sheets	1 in 4	No limit
Corrugated metal roofing	1 in 4	No limit
Sheet metal shingles	1 in 4	No limit
Slate shingles	1 in 2	No limit
Clay tile	1 in 2	No limit
Glass fibre reinforced polyester roofing panels	1 in 4	No limit